

Spontaneous haemopneumothorax

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Spontaneous haemopneumothorax is a rare disease and is reported in 2% to 5% of hospital series of spontaneous pneumothorax. In Ullevål Hospital, Surgical Department III, 228 cases of spontaneous pneumothorax were treated in the period 1960–70. Of these, five patients had haemopneumothorax, that is, approximately 2.2%. The treatment is surgical with effective drainage and replacement of blood loss. If full expansion of the lung and cessation of haemorrhage is not effected in the course of the first few days, thoracotomy should be resorted to with the intention of arresting the bleeding and sealing leakage from the lung surface by resection of areas with emphysematous bullae.

Spontaneous haemopneumothorax is characterized by accumulation of air and blood in the pleural cavity, not preceded by trauma. The condition was originally described by Laennec, who observed it at necropsy. Whittaker reported the cure of a case by aspiration. In the year 1900 the condition was described in detail by many authors (Boland, Pitt, Rolleston). Thoracotomy and decortication of the lung six weeks after the onset was described in 1948 by Elrod and Murphy. This is the first report of operative treatment.

The cause of spontaneous pneumothorax is a rupture of subpleural emphysematous bullae or 'blebs', which communicate with the bronchial tree. Usually no bleeding results from this rupture, but when vascularized adhesions have formed between the parietal and visceral pleura, and these are torn when the lung collapses, haemopneumothorax develops. The vessels of the adhesions have no muscular components and normal retraction is prohibited (Deaton and Johnston, 1962). The fact that systemic blood pressure is present in these vessels contributes to maintenance of bleeding, and so also does a low pressure in the pleural cavity, when such is present.

The symptoms are those of spontaneous pneumothorax with the addition occasionally of those from massive blood loss. A sudden moderate chest pain, either at rest, during slight physical exertion or on coughing, is characteristic. The chest pain is accompanied by a variable degree of dyspnoea which—except in the relatively rare cases of tension pneumothorax—is noticeable only on exertion. In tension pneumothorax, induced by a valvular

mechanism, the clinical picture may be dramatic, with rapidly increasing dyspnoea, cyanosis, and collapse. Collapse may, however, also be caused by bleeding. Spontaneous haemopneumothorax, with a tendency to collapse, may clinically simulate myocardial infarction, embolus of the lung or even severe acute abdominal lesions, such as acute pancreatitis and perforated gastroduodenal ulcer (Ross, 1952).

The condition is most common in the age range 20–40 years and has a definite prevalence in men (Rydell, 1959). Haemopneumothorax is reported in 2% to 5% of hospital series of spontaneous pneumothorax (Hyde and Hyde, 1951; Mills and Baisch, 1965), in one series in 12% (Rowell, 1956).

CLINICAL MATERIAL

In Surgical Department III of Ullevål Hospital, 228 cases of spontaneous pneumothorax were treated in the period 1960–70. Of these, five patients had haemopneumothorax, that is, approximately 2.2%. All were men aged 23 to 30 years (Table).

The total volume of aspirated blood, or blood plus reactive fluid, ranged from 1,500 to 2,200 ml. One patient was treated by three aspirations in the course of two weeks. One patient was treated with drainage (two drains) for two weeks. Three patients underwent thoracotomy, respectively three days, six weeks, and one month after the initial lesion. The indication for thoracotomy in the first and last cases was an accumulation of large masses of coagulated blood with compression and atelectasis of the lung, and in the second case continuous bleeding which could not be drained effectively. In the two last cases, decortication had to be done to secure full expansion of the lung.

All five patients showed clear chest radiographs on follow-up.

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TABLE

No.	Age	Symptoms	Side	Previous History of Chest Disease	Treatment			Operative Findings	Amount (ml) of Blood Transfused	Follow-up (yr)
					Aspirations	Drainage	Operations			
1	28	Chest pain, dyspnoea, cough	Right	Left-sided pulmonary tuberculosis	—	+ Large amounts of blood	Thora-cotomy, decorti-cation	Clot of blood (700 ml); pneumo-thorax (collapsed lung)	2,000	12
2	27	Chest pain, dyspnoea, collapse	Left	—	3 times 150 ml blood 950 ml blood 1,100 ml blood	—	—		500	3
3	23	Chest pain	Right	—	+ 250 ml blood	+ Amount unknown	Thora-cotomy	Clot over apex (500 ml) + 1,000 ml blood; pneumothorax	1,000	3
4	30	Dyspnoea	Right	Chest pain right side 6 months previously	3 times 1. 1,000 ml (serous) 2. negative 3. 50 ml (blood)	+ 800 ml blood (initially)	Thora-cotomy, decorti-cation	Blood clots; major air leakage	1,500	3
5	25	Chest pain	Right	—	—	+ 2,200 ml blood			2,000	3

Patient 1 was first treated in another hospital with thoracic drainage. Because of continuous bleeding the patient was transferred to this hospital after 4 weeks and operated upon.

Patient 3 was operated 3 days after the initial lesion.

Patient 4 was first treated with thoracic drainage and aspirations. The bleeding stopped and the lung expanded fully. He was discharged from hospital after 4 weeks and readmitted after 2 weeks.

All patients male; none gave history of trauma and the results of treatment were excellent in each case.

DISCUSSION

When, in addition, there is bleeding in spontaneous pneumothorax, there is a special need for effective drainage and also replacement of blood loss. Two or even three large-bore thoracic drains may be necessary and suction force should be 20 cm water at the minimum. If treatment is started early, it is usually possible to secure effective drainage and complete lung expansion, which is the main requirement to stop the bleeding. Repeated radiographs and great care and skill are necessary to secure effective, continuous drainage.

If, in spite of optimal effort, full expansion of the lung and cessation of haemorrhage is not effected in the course of the first few days, thoracotomy should be undertaken

- (1) to stop the bleeding and evacuate the pleural cavity of coagulated blood;
- (2) to seal air leakage from the lung surface by resection of areas with emphysematous bullae; and
- (3) to secure effective drainage by drains placed under direct vision.

Rubbing of the visceral and parietal pleura with dry gauze is performed to provoke formation of adhesions, since the presence of blood in the pleural cavity cannot be depended upon to prevent future relapse by rupture of any overlooked bullae.

The blood loss should be estimated by haemoglobin and haematocrit measurements in both the evacuated blood (this may contain variable amounts of reactive exudate) and the circulated blood. In our patients the volume of aspirated blood ranged from 1,500 ml to 2,200 ml. This corresponded closely with the fall in haemoglobin. Aspiration of a total of 8,000 ml apparently un-mixed blood in the course of 18 hours, reported by Mills and Baisch (1965), shows that bleeding may be severe. In neglected cases, that is when masses of coagulated blood have been allowed to form preventing lung expansion (possibly organization of the blood has started and even infection has supervened) decortication followed by effective drainage is necessary. This, however, is more difficult the longer the interval from the start of the bleeding.

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